

REMARKS

Applicants respectfully request that the foregoing amendments be made prior to examination of the present application. This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

Claims 1-14 are requested to be cancelled.

Claims 15-40 are being added.

After amending the claims as set forth above, Claims 15-40 are now pending in this application.

Amendments to the Specification

In the specification, a Substitute Specification under 37 C.F.R. §1.125 has been provided to replace the originally filed specification for clarity. No new matter has been added.

Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable consideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

Date May 19, 2006

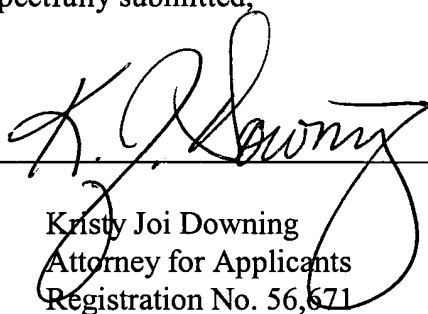
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SUBSTITUTE SPECIFICATION

VEHICLE SEAT, ~~especially for a motor vehicle~~

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present Application is a National Phase Application of PCT/EP2004/010970 entitled, "Vehicle Seat, Especially for a Motor Vehicle" filed on October 1, 2004 which published under PCT Article 21(2) on June 05, 2005 as WO2005/049368 A1 in the German language, which claims priority to German Patent Application DE 103 54 065.2 filed November 19, 2003, the entire disclosure of which, including the specification and drawings, is expressly incorporated herein by reference.

Description

BACKGROUND

[0002] The invention relates to a vehicle seat, ~~especially for a motor vehicle,~~ with a seat part made of a hard foam part and a soft foam pad.

Prior art

[0003] A vehicle seat upholstery part according to the generic type is known from patent application DE 198 45 730 A1. The upholstery part is designed as a backrest which has a sandwich construction and is composed of a shaped foam part of EPP, a soft cushion and a light metal shell ~~mold-situated therebetween in-between.~~ The shaped foam part is covered on the rear side by a rear wall element.

[0004] An upholstery part of this type is suitable, in principle, for reducing the weight of the vehicle ~~in comparison~~ compared to seats with conventional steel structures. However, the selected construction is suitable only for use in the case of backrests and, in addition, it is still relatively heavy because of the metal shell mold used.

Problem

[0005] ~~The invention is based on the problem of providing~~ Therefore, it is desirable to provide a vehicle seat which is further reduced in weight and is simple to manufacture.

Solution

SUMMARY

[0006] In one exemplary embodiment, a vehicle seat for a motor vehicle includes an upholstery part made of a hard foam part and a soft foam pad. The upholstery part is designed as a seat part. The hard foam part defines a first surface partially shaped congruently to a vehicle floor. The seat part can be configured in a use position and the seat part is configured to fit with the vehicle floor when in the use position. A hinge mechanism is configured to release the seat part from the vehicle floor and shift the seat part toward a not-in-use position.

[0007] In one exemplary embodiment, a vehicle seat includes a backrest and a seat part selectively coupled to a vehicle floor and the seat part is configured to abut an end of the backrest in a use position. The backrest is configured to recline with respect to the seat part. A transmission link is coupled to the backrest. A hinge mechanism is coupled to the seat part and the transmission link, configured to enable the seat part to at least partially pivot about the hinge mechanism. The hinge mechanism is coupled to a pinion gear engageable with the transmission link in a manner so that pivoting the seat back causes the seat part to pivot about the hinge mechanism.

[0008] In another exemplary embodiment, a vehicle having an interior at least partially defined by a vehicle floor, the floor including a protrusion, includes a seat assembly, selectively coupled to the vehicle floor and a backrest included in the seat assembly. A seat part is included in the seat assembly configured to pivot with respect to the backrest at one end between a use position and a stow or not-in-use position. The backrest is further configured to rotate in a frontward direction, toward the seat part, into a not-in-use position. A transmission link is coupled to the backrest for moving the seat part. A hinge mechanism is coupled to the seat part and transmission link, configured to enable the seat part to at least partially pivot about the hinge mechanism. The hinge mechanism is coupled to a pinion gear engageable with the transmission link in a manner to pivot the seat back in response to the seat part pivoting about the hinge mechanism. The seat part defines a recess configured to selectively juxtapose the recess of the seat part.

[0009] The problem is solved according to the invention by the upholstery part of the vehicle seat is according to the generic type being designed as a seat part

and the hard foam part ~~having~~ has a surface which, at least in some regions, is shaped congruently to the vehicle floor and, in the use position of the seat part, can be brought into a positive fit with the vehicle floor, the seat part being releasable from the positive fit and being shiftable into a not-in-use position by means of a hinge mechanism.

[0010] This design ~~makes it possible to dispense with~~ utilizes a solid hinge mechanism for the seat part that, in particular in the event of a crash, ~~conducts away~~ transfers the weight of the vehicle occupant into the vehicle structure. ~~On the contrary, the~~ The forces are transmitted by the positive fit directly from the hard foam part into the vehicle floor, ~~with the result that the~~ The hinge mechanism serves ~~only to~~ guide the movement of the seat part. It is therefore possible to secure ~~said the~~ seat part directly in the hard foam part, i.e. ~~dispensing with~~ eliminate the need for a metallic supporting structure arranged in the seat part.

[0011] ~~In one embodiment, the~~ The hard foam part is preferably composed of expanded polypropylene particle foam (EPP) from which complex, three-dimensional shaped parts of low weight can be produced cost-effectively.

[0012] The positive fit can advantageously be produced between a surface of the vehicle floor, which surface extends vertically essentially transversely with respect to the driving direction, and a surface of the hard foam part, which runs parallel ~~thereto to the vehicle floor, of the hard foam part, the~~ The surface of the vehicle floor preferably ~~being part of~~ includes a support-like arching ~~of the vehicle floor, said arching~~ running horizontally and transversely with respect to the direction of travel, ~~(Y direction), and the~~ The surface of the hard foam part ~~being defines~~ defines part of a first recess, which runs in the ~~same direction of travel~~, in the hard foam part.

[0013] ~~According to a particular design of the invention~~ According to one exemplary embodiment, the hinge mechanism comprises a hinge arm which is connected at one end in an articulated manner to the vehicle floor and is connected at its other end in an articulated manner to the hard foam part of the seat in such a manner that the seat part can be brought out of its use position into a not-in-use position shifted parallel thereto. The seat part is therefore not folded from its use position into the not-in-use position but rather the same surface side always faces the vehicle floor. In this case, both hinges preferably have an axis ~~axes~~ of rotation

extending in the direction of travel. ~~Y direction, with the~~ The hinge is coupled
~~assigned to the hard foam part, in the use position of the seat part, being and offset~~
~~rearward in a direction counter to the direction of travel (X direction) in relation to~~
~~the hinge assigned to the vehicle floor.~~

[0014] In order to simplify the initial installation, but also a fixing of the seat part
after it has been temporarily removed, it can be provided that the hinge ~~assigned~~
coupled to the hard foam part can be latched therein during installation of the seat
part.

[0015] In order also to secure the position of the seat part in the not-in-use
~~position, in the not-in-use position,~~ the seat part can preferably be brought into a
positive fit with the arching of the vehicle floor by means of a second recess in the
hard foam part. In this case, the first and second recesses may naturally have
contours which largely correspond and are offset in a direction parallel to one
another.

[0016] In order, in the event of a crash, to prevent the vehicle occupant from
slipping through under the lap belt, the upper side of the hard foam part is
preferably designed such that it drops rearward at an include in the form of a ramp.
In this case, a virtual straight line running between the surface of the first recess
and the ischial tuberosity (or the "tail bone") of the seat occupant is
advantageously inclined by an angle of 25° to 35° ~~[[,]] preferably~~ In one
exemplary embodiment, the angle is approximately 30°, with respect to the
horizontal in order to conduct away the forces of inertia, which are caused by the
weight of the seat occupant in the event of a crash ~~[[,]]~~ The weight may optimally
be transferred into the structure of the vehicle floor.

[0017] ~~In order to design the conversion of a vehicle seat, which is preferably~~
~~designed as described previously, such that it is particularly convenient, it~~ It can be
provided that the seat part is operatively connected to a pivotably mounted
backrest of the vehicle seat in such manner that, when the backrest is folded
forward from the upright use position into a not-in-use position, the seat part, ~~for~~
~~its part,~~ is shifted from the use position into the not-in-use position.

[0018] This is preferably brought about by the backrest being connected
rotatably to a transmission linkage which is ~~arranged offset~~ with respect to the

pivot axis of ~~said the~~ backrest. In this case, the transmission linkage can be equipped at its end assigned to the hinge arm with a rack-like toothing (or pinion gear) which is suitable, in conjunction with a ~~circular mating toothing gear~~ formed on the hinge arm, for producing a torque about one of its hinges. ~~For space reasons, the~~The mating toothing is advantageously formed in the region of that hinge of the hinge arm which is assigned to the vehicle floor.

Figures

BRIEF DESCRIPTION OF THE FIGURES

The figures illustrate an embodiment of the invention by way of example and diagrammatically.

In the figures:

FIG. 1 ~~_____~~ is a schematic depiction of the vehicle seat in a use position according to an exemplary embodiment. ~~shows a vehicle seat designed according to the invention in the use position,~~

FIG. 1a ~~_____~~ is a partial schematic depiction of a seat part of the vehicle seat in the use position according to an exemplary embodiment. ~~shows a less detailed illustration of the seat part according to fig. 1,~~

FIGs. 2-3 ~~and 3_____~~ are schematic depictions of the vehicle seat in several intermediate positions according to an exemplary embodiment. ~~show the vehicle seat according to fig. 1 in intermediate positions, and~~

FIG. 4 ~~_____~~ is a schematic depiction of the vehicle seat in a not-in-use position according to an exemplary embodiment. ~~shows the same vehicle seat in its not-in-use position.~~

DETAILED DESCRIPTION

[0019] The A vehicle seat assembly as illustrated in fig. FIGs 1-4 comprises a seat part 1 and a backrest 2 which is provided with a head restraint 3. The seat part 1 is composed of a hard foam part 4 made of EPP which drops on the upper side at an incline. ~~in the form of a ramp and which,~~The seat part 1 on its side facing the seat occupant, is provided with a soft foam pad 5 made of polyurethane foam. The ~~latter soft foam~~ is covered at the end with a textile or leather cover (not illustrated).

[0020] ~~As is apparent from illustrated in~~ FIG. 1a, the lower side of the hard foam part 4, which ~~side-rests~~ rests on the vehicle floor 6, is provided with recesses 7, 8 which are at a ~~distance-distanced~~ distance from each other in the direction of travel ~~[[,]] (or a forward direction)~~. The recesses 7, 8 are essentially identical in contour. ~~and of~~

~~which the~~ The front recess 7 engages with a positive fit around a support-like forward arching 9 (or protrusion) in the vehicle floor 6. In this exemplary embodiment case, at least one surface 10 of the recess 7, which ~~surface is~~ defined by an approximately vertical axis and an axis running transversely with respect to the direction of travel, bears against a surface 11, which runs parallel, ~~of to~~ the vehicle floor 6 in such a manner that shearing forces acting on the seat part 1 in the direction of travel ~~[[X]] are transferred conducted away into the vehicle floor. Of~~ course, ~~the~~ The transmission, by means of a positive fit, of centrifugal forces may additionally also occur by the formation of further correspondingly turned surfaces. ~~be provided by the formation of further, correspondingly turned surfaces.~~ It is likewise conceivable to place the seat part onto pins protruding from the vehicle floor. ~~The essential feature for the implementation of the invention is the presence of~~ The surface structures on the vehicle floor 6 and seat part 1 that are suitable, by means of surface contact, for the transmission of corresponding shearing forces.

[0021] In order to avoid a tilting of the seat part 1 in the event of a crash, the ~~imaginary straight~~ straight line, G , runs between the center of the contact region of the surface 10 and the ischial tuberosity 12, which is sunk into the soft foam pad 5, at an angle α ~~of~~ (which is approximately equal to 30° with respect to the horizontal). The surface 10 is oriented orthogonally with respect to the straight line G , and is therefore inclined by 60° with respect to the horizontal and ~~therefore runs essentially~~ substantially vertically.

[0022] To ~~interecept~~ counteract a torque ~~nevertheless occurring about the contact region of the surfaces 10, 11, the rear region of the seat part 1 is pushed under the backrest 2 and is pulled out of this means of securing during the transfer into the not-in-use position (see as shown in fig. 1).~~ The hinge mechanism 13 used for this comprises a hinge arm 14 which is oriented horizontally in the use position of the seat part and is connected rotatably via a first hinge 15 to the vehicle floor 6 and via a second hinge 16 to the hard foam part 4 of the seat part 1. For the insertion of the seat part, with the hinge arm 14 fitted on the vehicle floor 6, the hinge 16 can be latched into a clip connection 17 of the hard foam part 4. The clip connection 17 is screwed down directly in the hard foam part 4. Since the hinge mechanism 13

only has to absorb the ~~low dead-weight~~ of the seat part 1 as it shifts into the not-in-use position, high-strength inserts in the seat part 1 can be eliminated ~~dispensed with~~.

[0023] ~~A~~ The coupling of the movement of the backrest 2 and seat part 1 is brought about by a transmission linkage 18 which is shaped in the manner of a 'J' and is mounted rotatably on the backrest 2 ~~in to~~ a hinge 19 in a manner ~~such that it is to~~ offset downward in relation to the pivot axis 20. When the backrest 2 is folded forward (as shown in FIGs 2-4 ~~figures 2 to 4~~), the transmission linkage 18 is displaced rearward counter to the direction of travel. The front end of the transmission linkage 18 ~~is with a~~ has rack-like tothing 21 which is ~~in engagement~~ configured to engage with a circularly designed mating tothing 22 (or gear) ~~of on~~ the hinge arm 14 and pivots the latter forward about the hinge 15 in the space above the vehicle floor 6. In the process, the seat part 1 is raised in the front region by the hinge arm 14, with the front recess 7 ~~first of all~~ being moved essentially upward in relation to the forward arching 9 and its rear end, which is mounted displaceably in a rail guide (not illustrated), being pulled forward under the backrest 2.

[0024] When the not-in-use position is reached (as shown in fig. 4), the seat part 1 is again in a horizontal position, i.e. it has been shifted in a direction parallel in relation to the use position, ~~according to fig. 1~~. In this case, the rear recess 8 is placed onto the support-like forward arching 9 of the vehicle floor 6 with a positive fit by ~~an essentially~~ a substantially downwardly directed ~~relative~~ movement during the last stage of the ~~movement~~ sequence, with the hinge arm 14 again taking up a horizontal position ~~but in~~ which it is rotated through 180° in relation to the initial position.

[0025] The hard foam part is preferably composed of expanded polypropylene particle foam (EPP) from which complex, three-dimensional shaped parts of low weight can be produced cost-effectively.

[0026] While the exemplary embodiments illustrated in the FIGS. and described above are presently preferred, it should be understood that these embodiments are offered by way of example only. For example, the teachings herein can be applied to any seat and are not limited to a vehicle seat. Accordingly, the present seat is

not limited to a particular embodiment, but extends to various modifications that nevertheless fall within the scope of the appended claims.

ABSTRACT

Provided is a vehicle seat which is positionable between a use and not-in-use position convenient for increased storage space and access to rearward areas of the vehicle. The vehicle seat includes a seat part and a backrest. The seat part is pivotably coupled to the vehicle floor at one end so that that the seat part may be moved frontward with respect to the vehicle. A transmission link is provided, coupled to the backrest and the seat part so that the backrest pivots into the not-in-use position as the seat part is moved into its not-in-use position.

Designations

- 1 ——— Seat part
- 2 ——— Backrest
- 3 ——— Head restraint
- 4 ——— Hard foam part
- 5 ——— Soft foam pad
- 6 ——— Vehicle floor
- 7, 8 ——— Recess
- 9 ——— Forward arching
- 10, 11 ——— Surface
- 12 ——— Ischial tuberosity
- 13 ——— Hinge mechanism
- 14 ——— Hinge arm
- 15, 16 ——— Hinge
- 17 ——— Clip connection
- 18 ——— Transmission linkage
- 19 ——— Hinge
- 20 ——— Pivot axis
- 21 ——— Toothing
- 22 ——— Mating toothing

- G ——— Straight line

Patent claims

1. — A vehicle seat, especially for a motor vehicle, with an upholstery part made of a hard foam part (4) and a soft foam pad (5), characterized in that the upholstery part is designed as a seat part (1) and the hard foam part (4) has a surface which, at least in some regions, is shaped congruently to the vehicle floor (6) and, in the use position of the seat part (1), can be brought into a positive fit with the vehicle floor (6), the seat part (1) being releasable from the positive fit and being shiftable into a not in use position by means of a hinge mechanism (13).

2. — The vehicle seat as claimed in claim 1, characterized in that the hard foam part (4) is composed of expanded polypropylene particle foam (EPP).

3. — The vehicle seat as claimed in either of claims 1 and 2, characterized in that the positive fit can be produced at least between a surface (10) of the vehicle floor (6), which surface extends essentially transversely with respect to the driving direction and vertically, and a surface (11), which runs parallel thereto, of the hard foam part (4).

4. — The vehicle seat as claimed in claim 3, characterized in that the surface (11, 12) of the vehicle floor (6) is part of a support like forward arching (9) of the vehicle floor (6), said forward arching running horizontally and transversely with respect to the direction of travel (Y direction), and the surface of the hard foam part (4) is part of a first recess, which runs in the same direction, in the hard foam part (4).

5. — The vehicle seat as claimed in one of the preceding claims, characterized in that the hinge mechanism (13) comprises a hinge arm (14) which is connected at one end in an articulated manner to the vehicle floor (6) and is connected at its other end in an articulated manner to the hard foam part (4) in such a manner that the seat part (1) can be brought out of its use position into a not in use position shifted parallel thereto.

6. — The vehicle seat as claimed in claim 5, characterized in that both hinges (15, 16) have axes of rotation extending in the Y direction, with the hinge (16) assigned to the hard foam part (4), in the use position of the seat part (1), being

~~offset rearward counter to the direction of travel (X direction) in relation to the hinge (15) assigned to the vehicle floor (6).~~

~~7. The vehicle seat as claimed in claim 5 or 6, characterized in that the hinge (16) assigned to the hard foam part (4) can be latched therein during installation of the seat part (1).~~

~~8. The vehicle seat as claimed in one of claims 5 to 7, characterized in that, in the not in use position, the seat part (1) can be brought into a positive fit with the arching (9) of the vehicle floor (6) by means of a second recess in the hard foam part (4).~~

~~9. The vehicle seat as claimed in one of the preceding claims, characterized in that the upper side of the hard foam part (4) is designed such that it drops rearward in the form of a ramp.~~

~~10. The vehicle seat as claimed in claim 9, characterized in that a virtual straight line (G) running between the surface of the first recess and the ischial tuberosity (12) of the seat occupant is inclined by an angle of 25° to 35°, preferably approximately 30°, with respect to the horizontal.~~

~~11. The vehicle seat, in particular as claimed in one of claims 5 to 10, characterized in that the seat part (1) is operatively connected to a pivotably mounted backrest (2) of the vehicle seat in such a manner that, when the backrest (2) is folded forward from the upright use position into a not-in-use position, the seat part (1), for its part, is shifted from the use position into the not in use position.~~

~~12. The vehicle seat as claimed in claim 11, characterized in that the backrest (2) is connected rotatably to a transmission linkage (18) which is arranged offset with respect to the pivot axis (20) of said backrest and by means of which a rotation of the hinge arm (14) can be brought about.~~

~~13. The vehicle seat as claimed in claim 12, characterized in that the transmission linkage (18) is equipped at its end assigned to the hinge arm (14) with a rack-like toothing (21) which is suitable, in conjunction with a circular mating~~

~~tooth (22) formed on the hinge arm (14), for producing a torque about one of its hinges (15, 16).~~

~~14. The vehicle seat as claimed in claim 13, characterized in that the mating tooth (22) is formed in the region of that hinge (15) of the hinge arm (14) which is assigned to the vehicle floor (6).~~